Small
Business
Innovation
Research

Autonomous Leak Detector for Orbiting Spacecraft

SI Diamond Technology, Inc.
Austin, TX

INNOVATION

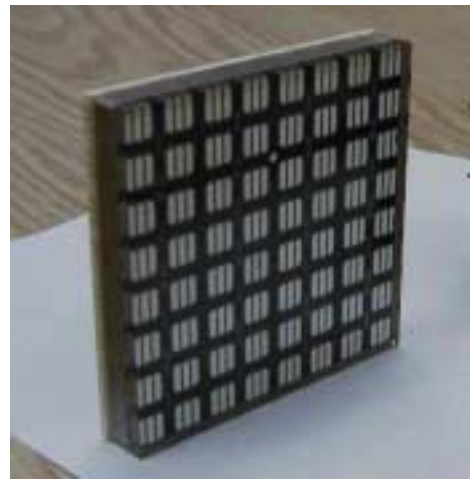
A Time-of-Flight Mass Spectrometer (TOF-MS) design that employs continuous ionizations. Continuous ionization requires less power than the usual pulsed ionization

ACCOMPLISHMENTS

- Using this innovation a leak detection was built to monitor in-orbit leaks in spacecraft
- The TOF-MS from this innovation was used to monitor impurities in materials. Although the SBIR was awarded to Schmidt Instruments, Inc., most of this development was done after a name change to SI Diamond Technology, Inc.

COMMERCIALIZATION

- Using this TOF-MS, SI Diamond Technology, Inc. developed the capability to monitor impurities in thin film diamond. As a result they refocused the company to diamond technology
- The thin film diamond technology is expected to be used in large flat screen displays for various digital advertising applications



High Definition Picture Element Tube (PET-HD)

GOVERNMENT/SCIENCE APPLICATIONS

- The University of Houston's "Space Vacuum Epitaxy Center" purchased two TOF-MS for use in the "Weight Shield Facility Program"
- As part of the "Weight Shield Facility Program" the TOF-MS flew on three Shuttle flights in a control loop to monitor atomic oxygen and atomic hydrogen impurities for a process to improve thin film gallium arsenide production. The Shuttle flights were STS-60 (Discovery, Feb. 94), STS-69 (Endeavor, Sept. 95), and STS-80 (Columbia, Nov. 96)

Glenn Research Center
Turbomachinery and Propulsion Systems
3-047

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